How do I build green?

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Though it places
a special focus on
the environment,

building green

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Deciding to build green is more than deciding to add certain energy-saving technologies to your building project. In fact, it may involve very little technology at all. Building green is a mind-set, an approach to making decisions that are based on a holistic understanding of the needs of your organization, the realities of the external environment it impacts, and the way building systems work together.

The integrated design approach is the cornerstone of green building design. It is also, simply, a smart way to build because it emphasizes planning and coordination in the beginning of the process that may prevent expensive oversights during and after project completion.

BUILDING GREEN EMPLOYS ECOLOGICAL THINKING TO CREATE ENVIRONMENTALLY RESPONSIBLE BUILDINGS THAT ARE BENEFICIAL TO THEIR OWNERS, OCCUPANTS, AND COMMUNITIES.

GETTING STARTED: THE INTEGRATED DESIGN PROCESS

Listening to stakeholders will help you build the right building

The green building process starts with a meeting of many stakeholders: people who are going to work in the building, those who will operate and maintain it, your nonprofit organization's leadership, the building designers, professionals who will oversee commissioning (testing), and people within the community. As a nonprofit organization, you may have more community stakeholders than would a commercial organization.

A green building project starts with a broad-based kickoff meeting called a charrette.

This meeting, called a charrette, is intended to allow stakeholders to share their desires and concerns about the building-to-be. This helps you pin down the official "intent" of the building, which, ideally, would be one that satisfies the wishes of most charrette participants. And because everyone gets a chance to voice his or her opinion and help shape the plan, participants have a prime opportunity to "buy-in" to the project and become valuable long-term supporters. For a nonprofit that depends on support from its community, buy-in is essential.

With the purpose of your new building, your organization's special needs and considerations, and your environmental goals in mind, you are ready to convene this meeting. Facilitate the charrette with a goal of capturing ideas and sentiments that can inform your project team meetings.

Charrette topics

Purpose of the building What is the mission of the organization, and how must the building support that mission? Are there other community purposes for the building? Should it be an educational tool? Should it provide more space than does your current building? Are there any special requirements based on the work you do?

Environmental goals What will be the environmental focus (or priorities) for your project? Do you plan to recycle? Will you use recycled materials? Will you consider the effects of demolition or use of your space after your organization ceases to use it? How flexible and multipurpose should your building be? Will you reduce water use? Energy use? Will you strive for efficiencies and a pleasant atmosphere with regard to heating, cooling, ventilation, etc.?

Economic goals What percentage of savings do you strive to achieve as the result of energy efficiency? Water use? What is the maximum first cost of the building? Would there be any demolition costs to consider? How do lifecycle costs factor in—in other words, how much will the building cost to maintain? How long are features of the building expected to last? How much are replacement costs?

Challenges What are the challenges associated with this building project? Possible solutions? On what topics must you gain consensus or clarity before the project team can move forward? Are there any variables—does something depend on something else? What are any barriers to resolving issues? How can they be overcome?

Non-negotiable factors What must be accomplished in the creation of this building? Are there special site requirements? Should historic preservation be undertaken? Are special materials to be used? Must in-kind contributions be utilized? Have donors made funds contingent on any special activities or accomplishments?

Values of your organization Does your organization have a stated or implied set of values? What requirements do these values necessitate for a building that you would create? How does this help you prioritize the green attributes—as well as other important attributes of your building?

Community values, support, and opportunities What does your community value and prioritize? How can these values be supported by (or at least not cause conflict with) your building? Are there any supporters of the work you do or of green efforts who might help you with this project? What opportunities related to this project are presented by corporations, government agencies, funders, or peer organizations?

Community requirements and restrictions Describe your community—your local community and whatever community you may engage in the work you do. What special needs or considerations exist? What building ordinances are there to consider? What about emissions? Do any requirements or restrictions change how you might pursue green goals (and other goals)?

Needs and concerns of various stakeholders How will your employees use the building? What are their work styles and needs? What do other building users need the building to do or provide? What would funders like to see? The community? Other organizations or individuals with whom you interact?

THE PROJECT TEAM

In order for a building to work harmoniously, its planners must collaborate

From the very beginning of a green project, everyone who contributes to the building—from its architect, landscaper, furnisher, heating and cooling specialist, window designer, and lighting expert, to the boss, custodian, and others—works together to achieve connected goals. When contributors talk to one another, they often find ways to make systems work harmoniously so that the organization can save money, support its workers' health and satisfaction, and leave the smallest possible "footprint" on the environment.

The internal team you engage to carry out your green building project must be representative and collaborative. It works best when it reflects a number of disciplines and decision-making capacities.

A project team may include eight to fifteen individuals[1]

- Building owner, occupants, and maintenance personnel
- Architect, excavator, landscape architect, interior designer, engineers (all disciplines), special consultants (e.g., acoustical), and commissioners
- Contractors and subcontractors
- Local officials
- Product manufacturers

Active collaboration enables pollination across disciplines. It allows a person responsible for one system to understand how that system will be impacted by others and vice versa. It also fosters "optimization"—when one or more jobs is accomplished with the fewest possible resources.

Within this group, there must also be a project champion, someone who will keep the group focused and rally support and morale—within the organization and in its external community. Consider someone for this role who is very passionate about your organization and the work it does—someone who also places great value on the environment and the health and happiness of the people who work in the building. This person could be you!

[1] WBDG Aesthetic Committee. "Appreciate Integrated Design," Whole Building Design Guide, www.wbdg.org.

Project team topics

The first thing your project team can do when it gets together is review the documented results of the charrette. Consider what is feasible. Prioritize among the goals. Make decisions about each of the topics discussed by the charrette group, filtering that information through the following screens: organizational needs and priorities; work processes and requirements; project scope, timing, and budget; fundraising; and maintenance.

Building location and siting Is this the best site for what we wish to do? Can we avoid using a pristine "green field" for building purposes? Will existing structures be used? Should aspects of the site be improved with regard to history, culture, or the environment? Is there room for expansion? Low-maintenance plants and materials should be used in landscaping—do we know what species are native to this area and would, thereby, require the least fertilization and water? Should trees be planted to provide shade? How close is this site to the residences of the eventual building occupants? What sorts of transportation (other than auto) are accessible? Will the building be close to places to eat, shop, bank, etc.?

Building orientation For our local climate, what direction would the building need to face to take best advantage of sunlight or shelter? How should the building be situated to make it most accessible? What other factors should we consider when thinking about our building's orientation? If an existing structure, what adaptations are desirable and possible?

Building skin Depending on our climate, what sort of building "skin" would work best? It is important to keep temperatures inside ideal, while allowing for adequate ventilation. A building's roof, walls, windows, and foundation should work together. Will double- or triple-pane windows be used to cut energy expenses? Will the walls be wood, steel, concrete, etc.? Can recycled or renewable materials be used?

Heating and cooling What sort of system will be used? How large should rooms be, considering heating and cooling, as well as user needs? Can cooling loads be reduced by fans, dehumidifiers, passive ventilation, or natural cooling techniques? Can heating energy be supplemented with solar panels?

Lighting In the United States, about 20 percent of electricity used in buildings is consumed by lighting. Will daylight be optimized to reduce energy use and eyestrain? Have energy-efficient lights such as compact fluorescents been selected? Can individuals select their own light, rather than rely on shared, overhead light that may be less efficient and perhaps too strong for everyone's work styles and needs?

Water conservation Will our building have low-flush toilets? Could toilets be designed to utilize rainwater or secondhand water from elsewhere in the building? Will we use faucet aerators or other devices to minimize water use? Will we capture water in a cistern for use in landscaping or in toilets? Is there a way to design the roof and any pavement to provide the least harmful runoff? Are there existing water systems that require improvement?

Materials Can we improve indoor air quality by selecting carpets, paints, and finishes that create minimal "off-gassing"? Is there a way to use materials that originate from the local area to save fossil fuels used for their transportation? Is there a way to use resources that are readily renewable? What materials will require the least maintenance (and the maintenance with the fewest chemical compounds) over the years? What recycled materials can be used? What materials will have recyclable value after the lifespan of the building?

CONSTRUCTION PROCESS

Building green requires attention to details

Aside from special attention to optimization and efficiency, the green building process is similar to that of traditional building.

Plan During planning phase, the team should articulate their goals, plans, and ideas fully and with clarity. The intent of the building should be documented and revisited to maintain focus. This "big picture" of the completed building becomes a decision-making guide for project participants as they push forward.

Design The design team should focus on making sure that the project is sized correctly in order to achieve goals specified in the planning process, as well as perform critical analytical studies on site utilization, building orientation, and landscaping. The design team also determines when milestone reviews will take place, using these checkpoints to ensure progress is being made toward green (and other) goals.

Construct Your best option is to hire construction professionals that have had some experience building green. If this is their first green project, they (and you) should expect a steep learning curve. In any event, those responsible for construction and contracting should be well aware of the green planning and design goals for the project.

Maintain A green building is maintained by building managers, custodians, landscapers, other official maintenance personnel, and every building user. Thorough orientation should be part of the process of occupying your green building so that everyone interacting with it will understand proper care and the benefits that can result. Building managers or caretakers have an especially important role in the performance of a green building. If one system is not maintained properly, some or all of the gains of going green—efficiencies, environmental benefits, aesthetics—can be lost. This is true of traditional buildings, but because traditional building processes do not take advantage of optimization in the first place, loss of efficiency is less apparent.

COMMISSIONING

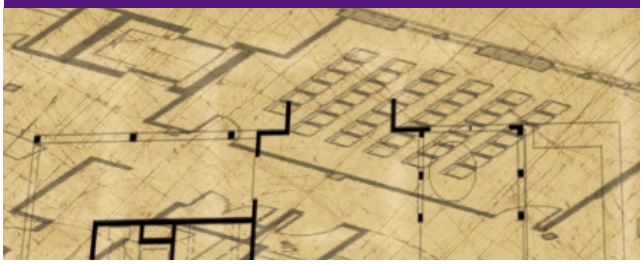
Proper testing is necessary to ensure efficiency

Commissioning is the testing and documentation of building systems. It is an important step to take under ordinary construction circumstances, but for a green project that strives for high levels of efficiency, it is even more valuable. Done well, commissioning helps quantify environmental quality and efficiency goals, improves energy use and equipment performance, eases the transition from builder to occupant and operator, and provides a history and roadmap for future users of the building.

Commissioning is conducted by an appointed commissioning authority. This person could be a construction manager, someone from an architectural or engineering firm, or an independent agent you select. He or she should have experience in green building projects and should understand your organization's goals and requirements for the building.

Key elements of a comprehensive building commission plan[2]

- Documentation of system design intent and operating sequences
- Verification of system performance based on documented functional testing and measurement
- Preparing and submitting operation and maintenance manuals (and increasingly, videos)
- Training of building and operations staff on system operations and maintenance procedures
- Ongoing monitoring of system performance



Traditional building projects employ commissioning techniques only during the construction process (if at all). In a green project, commissioning must begin early in the design phase of your project, as well as throughout the construction phase.

In the planning and design phases, the commissioning manager guides and documents the building performance goals. During the construction phase, performance tests are completed. Alterations in system design or specifications may be made to achieve desired results. Then, operation and maintenance instructions are developed. This information is passed on to the people who will take care of the building through its lifespan.

[2] Prowler, Don, FAIA. "Building Commissioning," Whole Building Design Guide, www.wbdg.org.

rewards of building green

A green building process, with its integrated and collaborative approach, is front-loaded: time and expenses are concentrated near project start. The reward is fewer unpleasant surprises and shifts in expectations during and after construction.

With careful management, committed leadership, and a collaborative team, your organization can create the building you desire—one that helps you support your mission, saves you money in the long term, provides a healthy and safe environment, and treads lightly on the earth.

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